

# SMALL ENTERPRISE FLEXIBILITY IN SUDAN

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## 1 INTRODUCTION

The 'flexible specialisation' paradigm (Piore and Sabel 1984) refers to industrial countries and claims to show an alternative to the industrial system in crisis. The crisis is interpreted as fundamental to the system of mass production; flexible specialisation is offered as a solution. The discussion on this paradigm has criticised some of the far-reaching conclusions of the authors but also pointed out that in some respects it can be useful to the analysis of industry in developing countries (e.g. Schmitz 1989).

This article draws on research on small industry, which could be the agent of flexible specialisation, in Sudan.<sup>1</sup> This research focuses on potentials and growth constraints of small industry. A macro-level study of national policy impacts, institutions and of existing analyses of small industry was combined with a micro-level study of small industry and its environment in the city of Nyala (Darfur Region, West Sudan). One of the potential distinctive advantages of small industry, i.e. advantages as compared to large industry, analysed is flexibility.

Flexible specialisation can be taken to imply the following elements:

- the use of flexible technologies (multi purpose machines)
- workers with a wide range of skills
- a wide range of products
- competition through innovation
- groups of firms cooperating

The main argument of this article is that such a structure requires an economic policy and an institutional climate favouring this innovative type of competition at the local and national level.

How is the situation in Sudan? Section 2 examines available material. As this material is very deficient in general, especially with respect to information on patterns of flexible specialisation, this is supplemented by results of a micro-level study (Section 3). Concluding remarks are given in Section 4.

## 2 EVIDENCE ON THE MACRO-LEVEL

### 2.1 Sudan's crisis of industrialisation: a crisis of large industry

Sudan is a classical case of a (mass-production) industrialisation crisis. While one can argue whether there really is a mass-production industry crisis in the industrialised countries, there can be no doubt that there is such a crisis in Sudan. It is a fundamental crisis of the industrial system (which is part of a wide socio-economic crisis). The industrial strategy pursued in Sudan is based on capital intensive and import dependent large industry enterprises, which are scarcely linked between each other or otherwise integrated into the domestic economic structure. Large industry enterprises in Sudan are in general specialised on few product lines, operate with specialised technologies and produce almost exclusively for the domestic market — manufactures have never been more than 10 per cent of exports. Nevertheless, Sudan's industry covers only a fraction of the demand for industrial products.

In Sudan large industry is defined as 'enterprises with 25 employees or more'. For pragmatic reasons, this definition is followed here. According to the statistics large industry constituted 72.8 per cent of total industry (in terms of employment) in 1981/82; for 1970/71 the figure was 87.0 per cent. These figures give, however, a biased view, as only a fraction of existing small industry establishments is recorded. Manufacturing value added per capita has decreased from \$71 in 1970 to \$36 in 1985,<sup>2</sup> and production figures are at best stagnant.

Policies of the independent government have, in this respect, been a continuation of colonial policy, which tended to drive out the traditional industries (all of them small industry), mostly by import of manufactured goods, but also by direct measures such as bans. The industrial decline is a result of large industry's inappropriate character and the impact of structural adjustment policy, which undermines its artificial comparative advantages.

Sudan is a classic example of a total neglect of and bias against small industry in developing countries, which

<sup>1</sup> The research was carried out in cooperation with the Sudanese Ministry of Labour and Social Security in the years 1987-89. The results are published in Hansohm (1992); see also Hansohm (1989)

and Hansohm and Wohlmuth (1990).

<sup>2</sup> See UNIDO (1989:15).

could be the agent for flexible specialisation. Government statistics and industrial policies based on them recognise only a fraction (the upper range in urban areas) of the existing small industry.

The policy bias against small industry expresses itself in programmes, legislation, and practice. The overall policy impacts are pervasive and mostly negative: they operate on the labour, capital and input markets; through different regulatory policies — registration, licensing, zoning, land allocation; protection measures for large industry, etc. The highly effective protection of industry and promotion facilities are either not accessible to small industry firms or less relevant for them.

Although several domestic and international development agencies have emphasised the positive performance of small industry and the need to redress the neglect and discrimination of this sector,<sup>3</sup> these proposals were hardly translated into action — neither by the donors nor by the government. The few attempts at small industry promotion had mixed success.<sup>4</sup> In any case, their impact was limited to a tiny minority of enterprises; compared with the policy impacts, the effect of these projects is marginal. In the context of structural adjustment policy, the emphasis in industrial policies, of donors as well as the government, was laid on rehabilitation of the existing large industry. But more important was the general tendency of declining interest in the industrial sector as a whole. The above described anti-small industry ideology turned out to be extremely persistent and stubborn and still determines government policy today.

## 2.2 The performance of small industry

How does small industry perform comparatively? The most common definition for small industry in Sudan is 'enterprises with less than 25 employees'. Although this is an arbitrary definition, clear differences between small and large enterprises appear in the statistics:

- small industry needs on average 50 per cent of the capital per employee in 1981/82 needed by large industry (in comparison to 64 per cent eleven years before)<sup>5</sup>;
- large industry attained only 12.8 per cent of small industry's profitability<sup>6</sup> in 1981/82 (73.7 per cent eleven years before);
- large industry has a lower capital productivity: 37.9 per cent of small industry's capital productivity in 1981/82 (43 per cent eleven years

before);

- large industry has an even lower labour productivity: 72 per cent of small industry's labour productivity (although this had been almost double eleven years before);
- on the other hand, wages were clearly lower in small industry in 1970/71 (58.3 per cent of large industry), but there was a trend of assimilation. In 1981/82 the average wages in small industry came to 82.0 per cent of those in large industry.

Although these data cut across sub-sectoral differences and under represent the small industry, they show significant differences between small and large industry and generally show a trend towards a relative improvement of small industry. The still lower wages in small industry do not, however, suggest that small industry is structured along the lines of the flexible specialisation paradigm — but the wage gap is narrowing.

Data directly relevant for the assessment of flexible specialisation are scarce in existing studies and in the industrial surveys. Indirect conclusions have to be drawn.

As mentioned above, modern large industry is generally capital intensive and dependent on foreign exchange with limited domestic interlinkages. Most industries produce consumer goods. Comparing the time of independence with 1970/71, some production of intermediate and capital goods emerged. This, however, was reversed in the following decade: consumer goods amounted to 81.5 per cent of manufacturing output in 1981/82 against 69.0 per cent in 1970/71. This trend is even stronger for small industry with 88.7 per cent and 44.4 per cent respectively. The strong overall orientation towards consumer goods production points to a low degree of specialisation and linkages between industries.

This picture of low interlinkages and high import dependency of large industry is confirmed by the figures on the degree of processing (value added as percentage of output): large industry attained only 53.0 per cent of the small industry values in 1981/82 (70.4 per cent in 1970/71).

The national figures and micro studies do not say anything about elements of flexible specialisation as defined above. Although many sources mention flexibility and ability to innovate as strong points of

<sup>3</sup> The ILO made this emphasis as early as 1976, while other organisations followed later; the World Bank included in its comprehensive industrial report (1987) the promotion of SI as one of 14 proposed fields of action.

<sup>4</sup> See Hansohm and Wohlmuth (1987: 183-186); Oehler (1989).

<sup>5</sup> There have been two comprehensive and comparable industrial surveys from which these data are taken, see Department of Statistics (1976), Nimeiri (1976), UNIDO (1986).

<sup>6</sup> The return on equity is measured as operating surplus divided by gross invested capital.

small industry,<sup>7</sup> very few micro studies support this impression with data. For this theme we have to turn to our own micro-level study.

### 3 CASE STUDY NYALA

Nyala is the major urban centre of the Western region Darfur, the country's most marginalised region (with the exception of the South). With more than 200,000 inhabitants it is — according to the shaky statistics — Sudan's most rapidly growing city and a microcosm of its current problems.

Our survey of the city's industries (1987/88) identified 33 sub-sectors encompassing 1263 establishments with a total of 4290 workers. Of these, 18 were large scale enterprises employing 939 workers (see Table 1). This contrasts with the 1981/82 industrial survey figures: these counted 7 large industry and 18 small industry establishments in 5 sub-sectors. Although even our 1987/88 figures are an underestimate (home industries were not included), the official statistical data represent an even greater underestimate of small industry.

Small and large industry are in fact highly different classes of industries: they operate in different activities. There is only one class with small as well as large enterprises: decortication firms include two enterprises

with less than 25 employees and six with 25 or more.

#### 3.1 Large industry in Nyala

Large firms are active in decortication, oil milling, sweets, soft drinks and ice, textile and soap industries. All of these belong to the mass production type of industry and do not show any of the characteristics of flexible specialisation:

- 1 The machinery is highly specialised for the production of very few items;
- 2 Workers have narrow qualifications (a high percentage of unskilled workers are employed);
- 3 Innovative activity is very low;
- 4 Hardly any cooperation with other industrial firms is taking place; small industry input to large industry is restricted to minor repair activities.

Even the sub-sectors supposed to be based on agricultural raw materials are highly dependent on imports because of their highly protected and regulated environment. These enterprises suffer under severe efficiency problems. The raw material supply is often interrupted by transport problems — Nyala is more than 2,000 km from the next sea port (Port Sudan on the Red Sea) and transport comes almost to a standstill during the rainy season (June-September). Due to raw material shortage all of the decortication, sweets, soft

Table 1: Size distribution of industries in Nyala in December 1987/January 1988 (number of persons employed)

Number of persons employed	1	2	3-5	6-10	11-24	25-50	51+
Decortication	—	—	—	—	40	96	166
Oil mill: modern	—	—	—	—	—	253	119
Other large industry	—	—	—	—	—	110	195
Grain mill*	—	—	258	—	—	—	—
Bakery*	—	—	403	—	—	—	—
Modern small industry	—	—	—	7	44	—	—
Tailors*	308	40	5	—	—	—	—
Leather work and tannery	90	60	92	7	114	—	—
Carpentry*	3	278	85	64	28	—	—
Metal workshops	7	32	257	356	170	—	—
Blacksmiths*	6	96	39	14	28	—	—
Tinsmiths	14	10	23	10	—	—	—
Repair	31	54	60	38	—	—	—
Other*	34	22	82	31	11	—	—
Total	493	592	1304	527	435	459	480

Source: Own survey; \* estimate; 'other large industry' consist of a sweets, a soft drinks and ice, a textile and a soap factory, 'modern small industry' of a snuff, two printing and a plastic factory, 'repair' of tyre, bicycle, watch, electric and car electricity shops, and 'other' of one traditional oil mill, informal gum-processors, goldsmiths, foundries, painting and dyeing and mattress producers.

<sup>7</sup> The 'traditional' view of small industry as being inimical to innovation and/or unable to innovate, is nevertheless widely spread

among government officials, development 'experts' and academics.

drinks and ice, textile and soap factories and 25 per cent of the oil mills were not working at the time of a second survey during the rainy season (August 1988). The transport difficulties also constitute a problem on the output side, as a major part of the large industry's production is directed to markets in Central Sudan: the local and regional markets are too small to absorb their production. In addition, the critical economic situation of the country results in foreign exchange shortages.

A drastic example of large industry's inefficiency is the textile factory, which, with 195 employees, is by far the largest employer in the city. It was situated in Nyala for political reasons, to demonstrate regional equality, but without proper consideration of economic feasibility. Raw materials (cotton) have to be brought more than 1000 km by train from Gezira province in Central Sudan. The main market for the textile is in the same region. Due to transport difficulties, the factory stands idle most of the time (nine months in 1987/89).

### 3.2 Small industry in Nyala

Of the small industry, three sub-sectors fall into the same production system as large industry: the snuff factory, the printing offices, and the plastic factory. They work with highly specialised machinery for the production of very few items, the worker qualifications are limited and somewhat low, no innovation is taking place, neither is there any firm cooperation. These sub-sectors suffer the same problems as large industry: efficiency problems and raw material shortage.

The other small industry sub-sectors fall into two different classes: on the one hand, there are the traditional indigenous industries with a long history, which are strongly integrated into the local economy from the input, output and manpower side, but operate at a low technological level. On the other hand, there are the modern small industry sub-sectors of a workshop type, which were only recently introduced and work largely with imported technologies and machinery. In the study four industrial sub-sectors were selected: the traditional type was represented by blacksmiths and tinsmiths, while for the modern industries metal and carpentry workshops were selected.

The small industry units in Nyala are much less capital intensive, more profitable and more capital productive than the statistics show, while labour productivity is lower. The wage level appears lower if compared with the 1981/82 data, but in 1987/88 incomes in small industry are comparable to both large industry and formal sector incomes — if not better (however, highly variable).

How do the four analysed small industry sub-sectors perform with respect to flexible specialisation?

#### 3.2.1 Blacksmiths

Blacksmithing is an old trade, traditionally practised by selected ethnic groups, and highly discriminated. However, this strict separation tends to be abolished: more and more individuals from other ethnic groups and from other trades, even from the formal sector, are participating in the trade of blacksmithing, due to the erosion of incomes of most occupations and a resulting relative improvement of the incomes of blacksmiths.

The blacksmiths use almost exclusively self-produced tools with which they produce a wide range of agricultural production and consumer goods. There is a limited division of labour, every worker is able to do any kind of work. So far they fit into the picture of flexible specialisation.

However, other factors do not fit into this picture: although there is some degree of cooperation between the blacksmiths, many of whom are situated at common places (most of them at the periphery of one market place), this cooperation does not result in any division of labour between them. Forms of cooperation are exchange of labour force, lending of tools, and division of large orders beyond the capacity of a single blacksmith unit. No permanent structure of division of labour has emerged.

Another remarkable aspect is the low degree of innovation. Little change has taken place in the tools, although the former raw material (iron ore) has been substituted by secondhand metal. The range of produced goods has also changed little. The only addition to the product range is the animal drawn plough, which has spread from Egypt. The spread of this innovation is not limited by any 'inability to innovate' as often alleged (most blacksmiths do produce ploughs), but by the low purchasing power of the agricultural population. Most farmers are just too poor to afford the needed animals.

Local development projects have, in some years, experimented with introduction of improved animal ploughs by delivering sufficient amounts of suitable raw materials and training blacksmiths in production. Blacksmiths have been shown to be able and willing to produce improved goods. The experience<sup>8</sup> indicates that the constraints to technological improvement are the low demand from the side of the agricultural population, rather than the inability to produce new goods.

Traditionally a main constraint to the development of

<sup>8</sup> See WSDC (1988), JMRDP (1988).

the blacksmith trade was seen in the contempt of manual labour; furthermore, the blacksmith trade was regarded as a despised trade, practised only by certain ethnic groups. But the ethnic diversity of present blacksmiths operating in Nyala shows that this is no longer a constraint.

The immediate constraints are external. At present, no managerial or entrepreneurial shortcomings can be identified and the mentioned efforts of development projects do not point to any problems in terms of training, entrepreneurship, or distrust. However, this does not mean that once the external constraints are removed, a structure of flexible specialisation will emerge.

While there is no structure of flexible specialisation, there are indicators of flexibility. In order to survive, blacksmiths combine different raw materials and access channels to raw materials, i.e. scrap bought from lorry drivers, traders, and metal workshops. They also operate with different modes of payment: they pay cash immediately, they ask clients for advance payments, they get a trader credit, or the raw material is provided by clients. They also sell their products to different customers: to end consumers, to merchants, and to the government. Another means to achieve flexibility is income diversification; most of the blacksmiths (77 per cent) combine their metal work with other sources of income: mainly, subsistence farming.

### 3.2.2 Tinsmiths

The tinsmiths also use a very simple technology to produce a wide range of consumer goods with hardly any division of labour: any tinsmith is able to do any work. Most tinsmiths work individually and very little cooperation takes place, although there is some exchange of labour force. Tinsmiths show, however, a high capacity to innovate by making a maximum use of different new and second hand raw materials. In this respect both traditional trades, blacksmiths and tinsmiths, exhibit a comparative advantage in comparison with the inflexible and under utilised large industry enterprises.

Tinsmiths produce mostly inexpensive substitutes for goods imported or produced by modern small industry. Nevertheless, this trade seems not to have expanded much in recent years, nor is it characterised by high incomes. An explanation for this may be the general deterioration of incomes of the largest part of the population. Tinsmiths are less flexible in terms of income sources (45 per cent have no farm land) as well as in terms of markets they operate on: roughly half of the analysed units sell only to end consumers, while merchants are the most important source of demand for the other half.

### 3.2.3 Carpentry

A high-income 'middle-class' is emerging in Nyala, which has an increasing demand for 'luxury goods'. This process mostly helps the carpentry workshops, some of which produce high quality expensive furniture. In carpentry, the product structure is subject to rapid diffusion of Western tastes through Sudanese nationals working abroad, but also through media as cinema, television (which few can afford), and catalogues of foreign carpentry styles. Also foreign advanced technologies are rapidly diffused, disproving any notion of people 'inimical to innovation'.

A far-reaching substitution of local raw materials inputs by imported materials has taken place, caused by import of foreign tastes and the ecological degradation leading to the disappearance of many local tree species. Flexible technologies are used and most of the production is specified according to the customer's wishes. Workers have a wide range of skills, mostly obtained exclusively during their apprenticeship in the workshops, which takes several years. As in the other trades, formal training plays a marginal role. Although carpentry workshops are not concentrated in one area, carpenters show the highest recorded degree of cooperation: the workshops with the most modern machinery (especially lathes) provide services for non-electrical workshops. These are in a subordinate position, but this relation does not lead to an undue exploitation through prices.

Thus, the carpentry trade comes closest to the criteria of flexible specialisation. With respect to income sources of carpenters, supplementary subsistence agriculture plays a minor role. On the other hand, carpenters produce for a wide geographical area, much beyond the local market: 17 per cent of them deliver to Khartoum, 24 per cent also export — to Central Africa.

### 3.2.4 Metal workshops

The metal workshops are concentrated almost totally in the Light Industrial Area, which gives a good opportunity for cooperation. However, their performance is not as impressive as that of carpentry. Multi purpose machinery is used and the workers display a wide range of skills (mostly learned at the workshops), but, the range of products is less wide than in carpentry and little innovation is taking place. On the contrary, there is a negative product diversification — the production of decortication machines (one of the few examples of production other than consumption goods) actually stopped because of lack of demand.

There are few examples of product innovation, e.g. attempts to copy foreign furniture designs recognised in catalogues. The picture is one of demand-led non-innovation. In the field of technological change, the diffusion of modern electric technology has been rapid

and refutes the claim of disability to innovate. Metal workshops also consist of electric and non-electric workshops, which do, however, show little cooperation.

Like the other analysed modern small industry sub-sectors, metal workshop owners exhibit less reliance on agriculture, which reduces their income flexibility. On the other hand, they increase their flexibility by also producing for regional and export markets.

#### 4 CONCLUSIONS

Sudan's modern industrial system — a mass-production system — is in a fundamental crisis. Small industry exhibits several positive features compared to large industry in terms of labour intensity, efficiency, and profitability. However, small industry in Sudan hardly shows a picture of flexible specialisation in terms of innovation, firm cooperation, or inter-firm specialisation. The macro-economic climate is highly hostile to small industry and the local policy is a mixture of 'benign neglect' and harassment — in any case no active institutional support. A planned New Industrial Area, far out of the city and without any connection to water and electricity supply, testifies to this. Especially noteworthy is the neglect and discrimination of traditional agriculture, which is a main source of demand for the traditional small industries.

It is not obvious that once these constraints were removed, a structure of flexible specialisation would emerge. However, the Nyala findings give no evidence

for internal constraints such as lack of training, problems of entrepreneurship, inefficiencies in management, or distrust, which would prevent a structure of flexible specialisation developing.

While Nyala small enterprises do not conform to the flexible specialisation paradigm, they show several characteristics of flexibility: flexible technologies are used, workers have a wide range of skills and produce a wide range of goods, and flexibility is also gained by a combination of different income sources — most importantly agriculture. This kind of flexibility is more pronounced in the traditional trades; modern small industry has largely lost this. Flexibility is also achieved by a combination of different modes of payment for raw materials, by operation in a variety of markets, and by addressing various customers without using middlemen. In times of economic crisis these kinds of flexibility give a decisive comparative advantage to small industry as compared to the inflexible large industry which is highly dependent on multiple forms of government support — this support is fading out in times of economic recession.

The kind of 'self-reliance' forced upon Sudan's large industry as an impact of structural adjustment policy could be a chance to develop efficiency and give a stimulus to the development to flexible specialisation. However, under present circumstances this chance remains theory: the economic climate is too depressed to consider investments in the industrial sector in any significant scale and the existing structures of inter-industrial linkages are too weak.

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